

ABSTRACT OF THE DISCLOSURE

A system for diagnostically evaluating the health of tissue within the fundus of an eye includes a f 's laser source, an adaptive optical assembly, an imaging unit, and a computer. The adaptive optical assembly focuses a laser beam to a focal point in the fundus of the eye, and scans the fundus tissue according to a predetermined scanning pattern. Illumination of anisotropic tissue within the fundus, such as the photoreceptors and the Henle-fiber layer, induces a Second Harmonic Generation (SHG) response. Red photons, with a wavelength (λ) of about 880nm, are converted to blue photons, with a wavelength of $\lambda/2$, through the process of photon conversion. An imaging unit senses the blue photon return light, and uses the return light to generate an image of the fundus. The computer processes the image, and compares it to a template of healthy tissue to evaluate the health of the imaged tissue.